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SUGGESTIONS FOR THE AGRICULTURAL EXHIBIT AT THE  
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The Subcommittee on Agriculture suggests that agriculture have a very prominent part in the Century of Progress and that one of the most imposing buildings in the exposition grounds be provided for agriculture and horticulture. It is our thought that the exhibits in this building should be of two types, (1) those which show the application of science to agriculture but which for the most part would be made by the Federal Government and the State agricultural colleges and experiment stations, and (2) displays of agricultural products and of industries related to agriculture such as those making agricultural machinery and supplies and those which utilize agricultural products. Exhibits in the first group would carry out the basic idea of the Century of Progress in showing the application of science to agriculture and would form a direct connection between the exhibits in the agricultural building and those in the pure science hall. They would of necessity be financed either from public funds or from funds supplied by the Century of Progress Exposition. The industrial exhibits, on the other hand, would be financed by the States or by the industries themselves and might be made a source of income to the exposition through the sale of space. It is our thought that in general these industrial exhibits should be made by associations or firms or corporations representing an entire industry rather than by individual corporations. For instance, the National Fertilizer Association might make a display rather than to have a dozen or more displays by individual manufacturers of fertilizers.





It is suggested that the agricultural building might have a great dome around the inside of which there might be a series of paintings illustrating either the history and development of agriculture in the United States, or typical scenes illustrating the agriculture not only of the United States but of the principal agricultural countries of the world. These paintings should be done by high class artists and should be carefully supervised by persons who are familiar with the subject matter so that they would not only be good art but good agriculture. If it is not deemed practicable or desirable to have a dome, then these paintings might be around the side walls of the building, but in any event they should be so placed that they may be easily viewed by visitors to the exposition.

The central feature of the exhibit illustrating the application of science to agriculture might well be a large map of the United States, 100 to 125 feet in its greater dimension, on which are shown State boundaries, principal rivers and lakes, and other important physical features. This map might indicate some of the important climatic features such as rainfall, and also the important agricultural products of the different sections. For instance, it could indicate the section where hard red spring wheat is grown, the hard red winter wheat section, the principal dairy and livestock sections, the corn belt, the cotton belt, etc. The map should not be so loaded with detail, however, that the important information it carries is not readily conveyed to the spectator. The map should be viewed from a raised platform from which all of it would be plainly in sight from any point. It should not be larger than the size indicated, but, on the other hand, it could not well be much smaller and contain the desired detail.





### Animal Industry

As meat production is one of the great industries of the United States, and as the packing industry was largely developed in and still centers in Chicago, livestock exhibits should have a prominent part in the agricultural display. It does not seem practicable to have an exhibit of either meat or dairy animals as a part of the Century of Progress Exposition, but excellent presentation of animal husbandry and dairy facts can be made without the inclusion of live animals.

The livestock exhibits would be principally along the lines of the application of the laws of genetics to animal breeding, the latest facts regarding nutrition in the feeding of live stock, and the contribution of science to the control of livestock diseases. The scientific control of diseases in animals is to a very large extent the work of the last hundred years and typical examples of such work should be included vividly in the livestock exhibit. As studies of animal diseases have contributed many points to our knowledge of human medicine, there should be correlation between the exhibit in this section and the medical exhibit elsewhere. There should also be correlation between the exhibit on animal breeding and that on genetics in the pure science hall.

Specifically, the animal industry exhibit might include such items as the following:

1. Extent of the livestock industry with special reference to numbers of animals and yields of meat and other livestock products.
2. Livestock breeding, including genetics and the application of breeding knowledge to herd and flock improvement.
3. Livestock feeding, including research in nutrition and its practical application.







4. Livestock management, including general care of animals, sanitation, etc.
5. Veterinary education, dealing with the growth of this profession and its shift from veterinary practice on horses to the application of veterinary knowledge to other live stock, including poultry.
6. Livestock diseases, with special reference to those of economic importance, such as tuberculosis, hog cholera, tick fever, etc.
7. Livestock parasites, with special reference to the injuries caused by both internal and external parasitic pests.
8. Poultry diseases.
9. Stock-poisoning plants which are of much importance to livestock producers, particularly in the Western States.
10. Federal meat inspection, illustrating the work of the meat inspection laboratories and the way in which this activity contributes to the public welfare.
11. Livestock quarantine, showing how the spread of animal diseases is prevented.
12. Animal products, particularly meats and wool.

In the animal industry exhibit, as elsewhere, there should be provided gas, compressed air, electricity, and in some instances, water. Electricity should be available throughout the agricultural building as there is likely to be large use of lantern slide and motion picture projectors, and light and motion will be largely used in the various exhibits to attract and hold attention and to illustrate important features.

#### Dairy Industry

Science has contributed very largely to the dairy industry during the past hundred years, and there has been an enormous shift during this period from the home production of butter for local sale to the very large centralized creameries, the movement of butter in refrigerator cars, and other large scale operations. Along with this development in butter manufacture and handling have of course come developments in the handling of fluid milk, the manufacture of cheese, and manufacture of milk powders, evaporated milk and other milk products.





The dairy exhibit should tie up with exhibits in the pure science hall on bacteriology and chemistry as well as those indicated in the previous discussion on animal industry. The work of Pasteur, Koch, and others in the control of fermentations is the basis of our modern dairy industry. A feature of the dairy exhibit might show the progress in this field by 25-year periods since 1833, the earliest one showing the small home dairy with poor animals and no knowledge on the part of the farm family with reference to sanitation, control of fermentation, and other factors. The displays illustrating the growth of knowledge during 25-year periods could bring us down to the modern methods of handling dairy products, their present wide diversity, and the scientific facts on which modern dairying and dairy manufacture are based. Dairying no doubt will be largely represented in the industrial exhibits.

An exhibit somewhat along the lines indicated, illustrating the progress of dairying from 1876 to 1926 was prepared by the United States Department of Agriculture for showing at the Secqui-centennial Exposition. The plans for this exhibit could be greatly expanded for the Century of Progress.

#### Field Crops

The wide diversity of crop production in the United States would naturally make this a very large and important feature of the agricultural exhibit. Crop material naturally divides itself into three important phases:

1. Crop production.
2. Plant breeding.
3. Control of diseases and insects affecting crops.

Crop utilization would come largely in the industrial section of the agricultural building. An important feature of the crop production section of the exhibit might well be a portrayal of the movement of crop production during the hundred years, illustrating for instance how the development of railroad transportation was largely responsible for the movement of wheat and





flax, and later of other crops westward from New York and Pennsylvania, across Ohio, Indiana, and Illinois, and finally west of the Mississippi River. Along with this could be illustrated the effect which the development of agricultural machinery, particularly harvesting machinery, has had on crop production in the United States. This development might be illustrated either in exhibit form or in the form of a motion picture. One of the facts which should be brought out prominently is the vast difference in amount of man labor required to produce a bushel of wheat now as compared with a hundred years ago. Similarly, there may be shown the very large shift in cotton production to the westward which has taken place in recent years and the effect which this has had and is having on the agriculture of the southeastern States.

In the crop production portion of the exhibit, corn and wheat naturally will have a very prominent place. The meat industry of the Upper Mississippi Valley is to a very large extent based on corn and the exhibit should stress the very great importance of corn to the section around Chicago and the wide variety of uses made of this crop. The wheat exhibit should show the different classes of wheat grown in the various sections of the United States and the particular uses to which these different classes are adapted.

Other important individual crops or groups of crops are the fiber plants, particularly cotton; sugar plants, including sugar beets and sugar cane; potatoes; tobacco, and forage crops, and some of the newer and very useful crops with large future possibilities, such as soy beans. It is not possible here to go into detail as to how the production of these crops might be developed, but this matter is covered fully in memoranda in the hands of the Committee on Agriculture, which can be made available to those charged later with the preparation of the exhibits.





### Horticultural Crops

The fruit and vegetable industry of the United States is large and important and naturally presents opportunities for extensive exhibits. The contributions of science to this industry through control of diseases and insects, refrigerator transportation, and various other lines might well be portrayed. For instance, an important feature could be made of the very great development in recent years of fruit and vegetable production, particularly vegetable production, during the winter and early spring months in the warmer sections of the United States and the movement of the product in refrigerator cars from the most remote sections of the country to the central markets. Probably the best illustration of this development is the enormous increase in lettuce production within the last few years.

### Plant Breeding

Important and interesting exhibits will of course be made to illustrate the application of the principles of genetics to the important plants, including field crops, fruits and vegetables, and ornamentals. These displays might illustrate the different types of corn, this bring the greatest contribution of the new world to agriculture, and might show recent progress in corn breeding through the isolation of selfed lines and the production of crosses between these strains. Similarly, the progress in the breeding of wheat and other cereal crops might be displayed. With cotton we could show the influence of breeding on length of lint and other characteristics of the cotton plant. There could also be exhibits illustrating specifically some of the principles of plant breeding.





### Disease and Insect Control

An important section of the plant industry exhibit would be that on the control of insects and diseases affecting plants, particularly our principal field and horticultural crops. This is a development almost entirely of the last hundred years and there could be portrayed here the application of our knowledge of fungi, bacteria, and insects, as well as that of chemistry and other sciences. The exhibit could well display graphically the life history of important diseases such as rust of wheat and other cereals and what is being done to control these diseases. We might well show that our knowledge is not yet complete in that there are certain diseases the control of which is not yet established, whereas with others, definite specifics are known if they are properly applied.

### Special Displays

An exceedingly interesting and attractive part of the plant exhibit naturally would be that with reference to ornamentals. It is our thought that there could well be, either in the agricultural building itself or in some of the convention rooms, which we understand are to be a part of the exposition, seasonal displays of flowers and ornamentals, and perhaps also of fruits. We believe there should be a flower show at the time of the opening of the exposition or soon thereafter, and another during the early fall months. There might also be displays at the proper time of some of the more important flowering plants separately, such as iris, peonies, and dahlias. Not only do we have a very extensive development in the production of ornamental plants in the United States, but there are organizations with large membership devoted to the growing and improvement of specific plants, such as roses, iris, dahlias, and chrysanthemums.



### Entomology

It is not our thought that there should be an entomological display as such in the agricultural building but that the control of injurious insects should be a part of the crop and livestock exhibits. There should, of course, be a place for a bee and honey exhibit illustrating the application of scientific knowledge to this special branch of agriculture.

### Chemistry

It is our understanding that a report on agricultural chemistry has been prepared by a subcommittee, of which Dr. Henry G. Knight is chairman. For that reason your Committee on Agriculture has not gone specifically into the application of chemistry to agriculture. There should, of course, be close correlation between the exhibits prepared at the suggestion of Doctor Knight's committee and those illustrating agriculture. The contributions of chemistry to agriculture in the field of fertilizers, the manufacture of sugar, and in many other lines are naturally of very great importance, and chemistry as applied to agriculture should be well represented in the agricultural building. The committee has in hand material submitted to it by Doctor Knight, which can be supplied if the report of the Subcommittee on Agricultural Chemistry needs to be supplemented to show its direct relationship to agriculture.

### Soils and Soil Physics

The agricultural building might well contain maps and exhibits illustrating the important agricultural soils both of the United States and of the world. It is our understanding that material on soils is being prepared by Dr. J. G. Lipman and others, but if this material in the hands of the National Research Council Committee is not sufficiently complete, the





Committee on Agriculture will be glad to supplement it with suggestions which have come to it.

#### Grades and Standards of Agricultural Products

While the subject of grades and standards of agricultural products can well be made a part of the crop and animal exhibits, this phase of agriculture is so closely related to commercial utilization of agricultural products that we believe it should have a prominent place in the agricultural building. We believe that the important market grades and standards of agricultural crops should be illustrated and that information should also be made available on market grades of live stock and meats.

#### Statistics of Agriculture

It is not thought that statistics of agriculture should make a separate part of the display, but naturally they will be used in maps and other graphic form to show the importance of various agricultural products, where they are most largely produced, and other facts of interest. If an exhibit is made by the Federal Government, it might include a graphic presentation of how agricultural statistics are gathered by the Department of Agriculture.

#### Economics and Marketing

A prominent place should be given to the development of cooperative marketing of agricultural products in the United States and to the growth of our knowledge in the field of agricultural economics. The Subcommittee on Agriculture has not yet developed specific suggestions as to how this material might be developed, but will be glad to go into this subject in detail if desired.





### Home Economics

Your committee has not gone into the field of the utilization of agricultural products in the home, nor into such subjects as human nutrition, home management, and clothing. We are not informed as to the section of the exposition in which material of special interest to women will be displayed. There are many phases of home economics work which might well be a part of the exhibit on agriculture, and it is our thought that a separate home economics committee might be developed or that perhaps a very attractive and interesting display might be made to illustrate the application of science to the modern home.

### Motion Pictures

While motion pictures are likely to be a prominent feature of many of the exhibits through use of daylight screens and continuous projecting apparatus, it is believed that there should be, as a part of the agricultural building, a motion-picture theatre, with a large seating capacity, in which regular programs of motion pictures of the most modern type can be presented, these pictures to illustrate the history of agriculture, particularly during the last hundred years, and the application of science to agriculture. Some exceedingly interesting pictures could be made if work is started at an early date.

### Suggestions to Other Committees

In a separate memorandum suggestions are made as to basic scientific facts and discoveries, which the Subcommittee on Agriculture feels might well be considered by the proper subcommittees for inclusion in their exhibits in the pure science hall.



### Industrial Exhibits

In the earlier paragraphs of this report the suggestion was made that the exhibits illustrating the application of science to agriculture should be supplemented by industrial exhibits. It is the opinion of the Subcommittee on Agriculture that an Industrial Committee should be set up to cooperate closely with the Subcommittee on Agriculture in the preparation of plans for Industrial exhibits for inclusion in the agricultural building. If desired, the Subcommittee on Agriculture will be glad to make suggestions as to persons who might be invited to make up this Industrial Committee.

### Space and Other Requirements

It is difficult to estimate the space required for the proper portrayal of the items included in such broad generalization as make up this report. It is the belief of your committee that adequate exhibition of the contributions of science to agriculture would require at least 100,000 square feet of space. This is, of course, in addition to space for the pure science exhibit on subjects contributing to agriculture and in addition also to the Industrial exhibits suggested in this report for which large amounts of space would of course be necessary. Space for the exhibits here discussed should be in general supplied with electricity and some of the exhibits would require gas, water, or compressed air. At this time, however, it hardly seems necessary to make specific statements on these points. There does not appear to be anything contemplated here which would require exhibits of unusual height or weight.





### Forestry

It is proposed to show as a central section of the exhibit illustrating the application of science to forestry, a small model forest, probably built up to the height of three or four feet. Surrounding this natural forest and tying directly to it, as well as to exhibits in the pure science building, would be exhibits illustrating utilization of forest products, such as wood distillation, production of ethyl alcohol, naval stores, pulp and paper, and cellulose products. Another exhibit which should be included in the forestry display would present the application of science to wood preservation. Timber physics and erosion control could also be presented.. An important feature of the forestry exhibit would illustrate land utilization and the relation of timber production to the production of food and fiber crops and live stock. Recreation and other social values of the forests might also be included.

### Agricultural Engineering

Progress in the application of power and machinery to agriculture, the development of farm buildings and farm drainage might well be shown in a series of four models illustrating conditions on the same farm in 1833, 1863, 1893, and 1933. The farmstead might be one in the Ohio Valley on which farm operations were just beginning in 1833. The model for that year would show that the farm was being developed by cutting off the timber, that only limited animal power was available, that the machinery was small and ineffective, that drainage was being done by hand ditching, and that the country was in a decidedly pioneer state. The farm of 1863 would show a larger proportion of cleared acreage, machinery of the type then in use, somewhat improved farm buildings, and both tile and open drains under construction.





The farm of 1893 would show modern mowers, binders, and threshing machines in operation, possibly a steam dredge in the background digging a drainage canal through a swampy portion of the farm, farm buildings of the fairly modern type, and other general improvements. The farm of 1933 would show the present use of tractors, combines, and other machinery of the latest type, with a dragline excavator in the background, cleaning out one of the old ditches. These separate exhibits could be displayed in alcoves, so that they could be seen one after the other but would be completely separated.

Irrigation development should be a feature of the agricultural engineering display. Different methods of irrigation, such as border flooding, overhead and cement pipe, and furrow irrigation would be included. The exhibit could be shown as a model of an irrigated farm on which the different types of irrigation were utilized in various sections.

The agricultural engineering exhibit should also include the application of engineering to the control of erosion, particularly by the use of terraces, soil-saving dams in gulleys, and other equipment. This should be closely correlated with the forestry exhibit to illustrate the use of trees in erosion control on steep slopes, and the use of terracing on cultivated land. The soil scientists would also be interested and would contribute to this portion of the exhibit.

